

Definition of the competence: Apprehend the basic knowledge/notions of Technology of Materials Title of module: TECHNOLOGY Class: 1 st year of mechanical engineering specialties (MARE, MAEL, MAIN, CAPA, MEFA, COOM, MEFE) Minimum weekly workload: 03H Minimum annual workload: 66H			Pedagogic Recommendations
Elements of the competence	Content of the competence	Assessment Indicators	
Apprehend the general notions on materials	General notions on materials • <i>Definitions of key terms on materials</i> • <i>Symbolization of metals used in metallurgy;</i> • <i>Physical and chemical properties of metals</i> • <i>Mechanical characteristics</i> • <i>Classification of metallurgic materials used in mechanical engineering</i>	- Define the key terms used in materials; - Identify physical and chemical properties of metals used in <i>mechanical engineering</i>; - List the <i>mechanical characteristics of metals</i>; - Classify the <i>metallurgic materials used in mechanical engineering</i>	
Apprehend notions on iron and ferrous alloys	Iron and ferrous alloys • <i>Notion of pure iron ;</i> • <i>Notion of iron metallurgy;</i> • <i>Elaboration of cast iron;</i> • <i>Properties and characteristics of cast irons;</i> • <i>Elaboration of steels;</i> • <i>Properties and characteristics of steels</i>	- Define the key terms - State the physical properties of pure iron, cast iron and steels; - Describe the elaboration principle of steels and cast iron ; - State the main usage of pure iron, cast iron and steels; - Identify the different metallurgic symbols of iron and its alloys; - List the mechanical characteristics of cast iron and steels; - Describe the elaboration process of ferrous alloys and the extraction principle of iron ore.	

Describe the protection methods of metals and metal alloys against corrosion.	Protection of metal against corrosion • <i>Notion of corrosion ;</i> • <i>Types and effects of corrosion;</i> • <i>Preparation of surface (cleaning, degreasing and polishing);</i> • <i>Methods de protection: by metallic and non metallic coating,</i> • <i>Method of protection by modification of the surface layer.</i>	- Define corrosion; - Describe the process of corrosion; - State the two types of corrosion; - State the methods of protection of mechanical pieces against corrosion; - List the stages of preparing a surface for protection against corrosion; - Describe the processes of protection of metallic and non metallic pieces.	
Apprehend the general notions of benchwork	Benchwork • <i>Benchwork operations;</i>	- List the conventional methods to realize a piece by benchwork;	
	Marking out • <i>Definition;</i> • <i>Aim;</i> • <i>Types of marking out methods (flat marking out with joining and overhead.</i> • <i>Study of marking tools and instruments;</i>	- Define the term marking out; - State the purpose of marking out; - List the different marking out instruments and tools; - Identify the marking out instruments and tools instruments et les outils de traçage - List the two methods of marking out.	
	Cutting of pieces <i>Aim;</i> <i>Study of manual sawing tool (Hacksaw and blades);</i> <i>Study of chisel</i> <i>Study of hand shears (shearing machine)</i> <i>Support and maintain in position of pieces during benchwork operations;</i> <i>Techniques of manual sawing;</i> <i>Technique of cutting with chisel;</i> <i>Technique of cutting with shears</i>	- State the purpose of manual sawing; - Describe the tools of manual sawing; - List the different tools and equipment used during benchwork operations; - Explain the technique of manual sawing.	

	Filing • <i>Definition;</i> • <i>Aim;</i> • <i>Study and classification of filing tools;</i> • <i>Techniques of filing flat or inclined surfaces, concave and convex shapes.</i>	- State the purpose of filing; - List the tools and equipments of filing; - Explain the techniques of filing.	
	Shaping of pieces • Bending on the vice • Rolling	- Explain the techniques of bending and rolling	